

BIOE.44

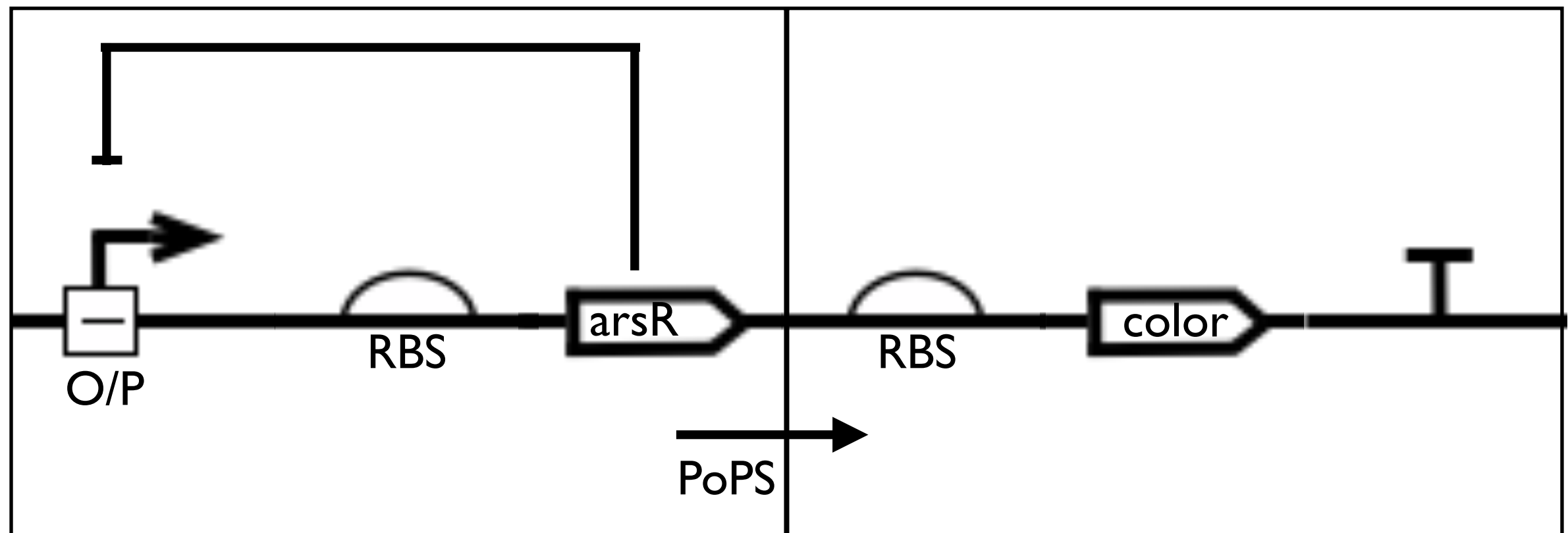
Synthetic Biology Lab

22 April 2010 Lecture / Discussion notes

<http://openwetware.org/wiki/Stanford/BIOE44>

Today's take away:

1. Can you find the devices? (Why PoPS matters)



Arsenic-to-PoPS Sensor Device

PoPS-Color Generator Device

Symbols from:

http://openwetware.org/wiki/Endy:Notebook/Synthetic_Biology_Open_Language



Nature **403**, 335-338 (20 January 2000) | doi:10.1038/35002125; Received 6 July 1999; Accepted 9 November 1999

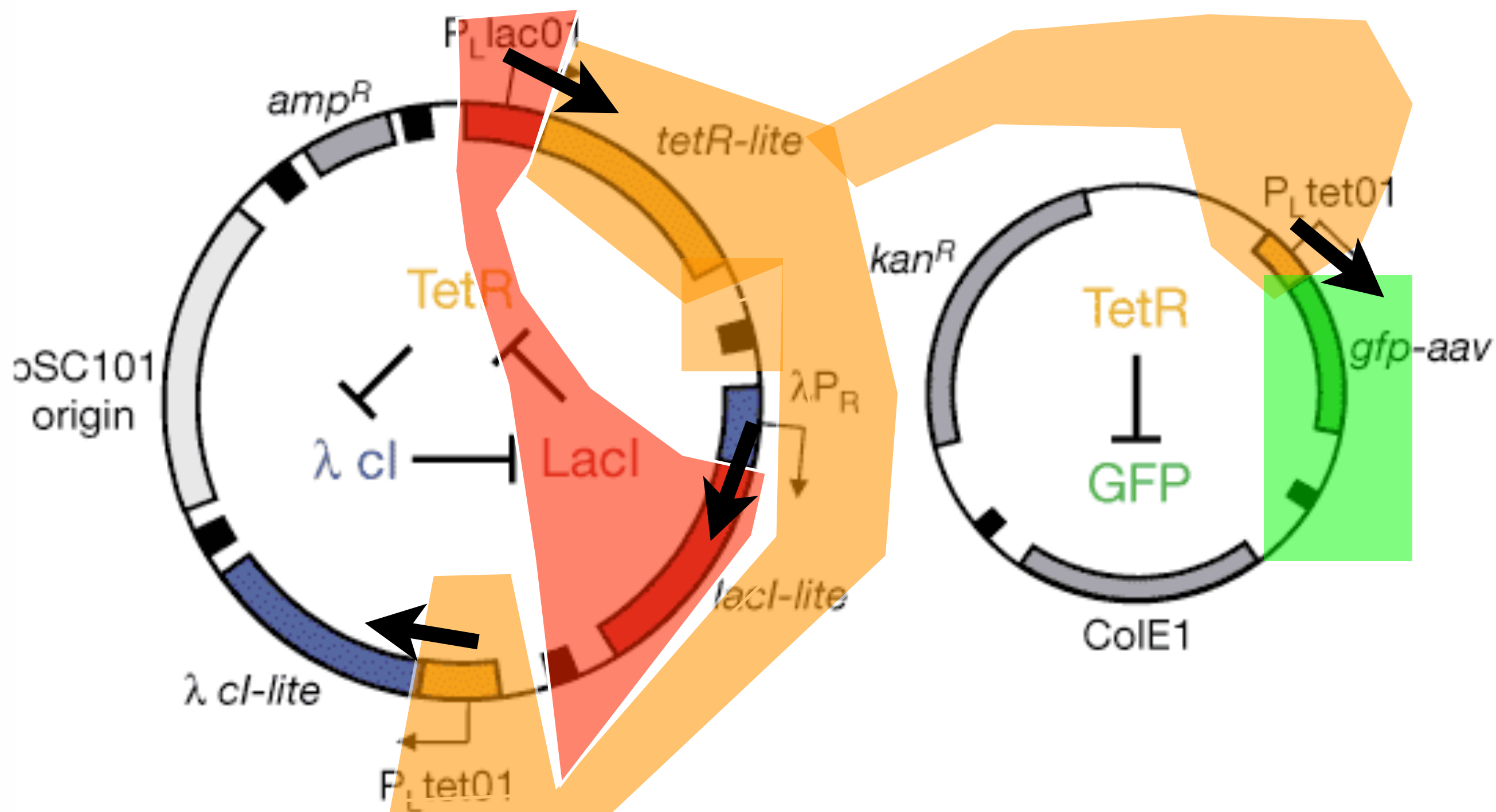
A synthetic oscillatory network of transcriptional regulators

Michael B. Elowitz & Stanislas Leibler

a

Repressilator

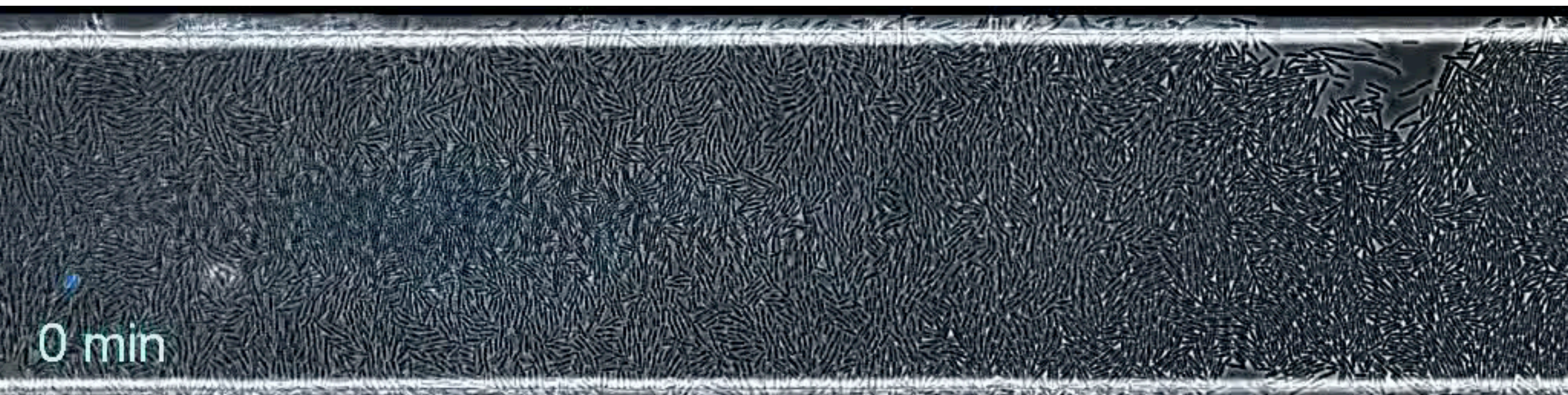
Reporter



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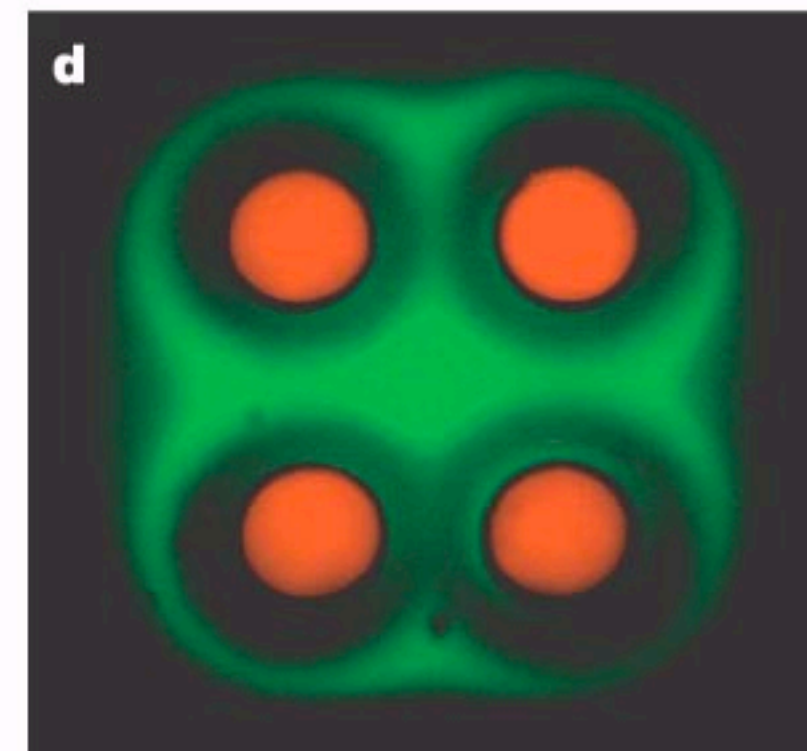
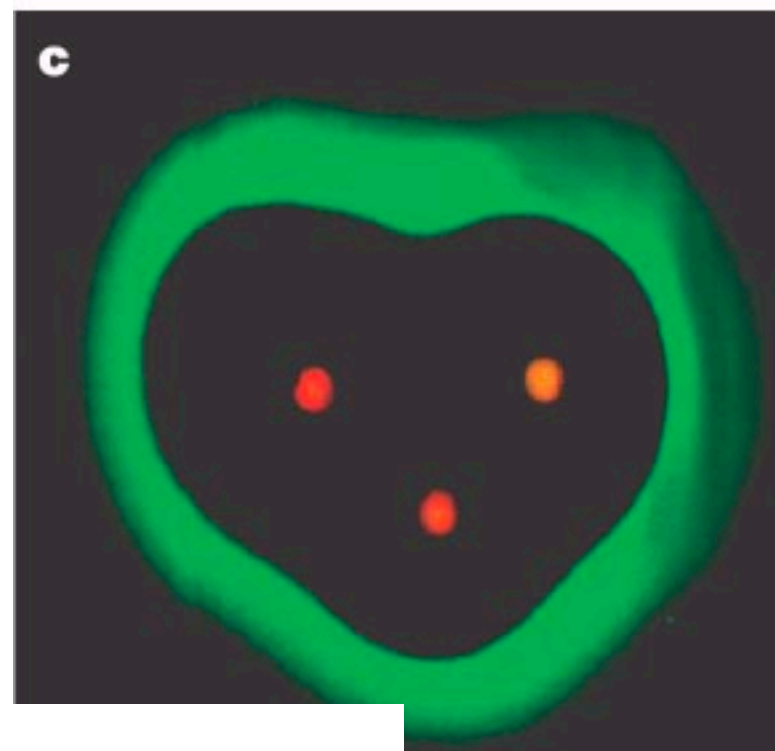
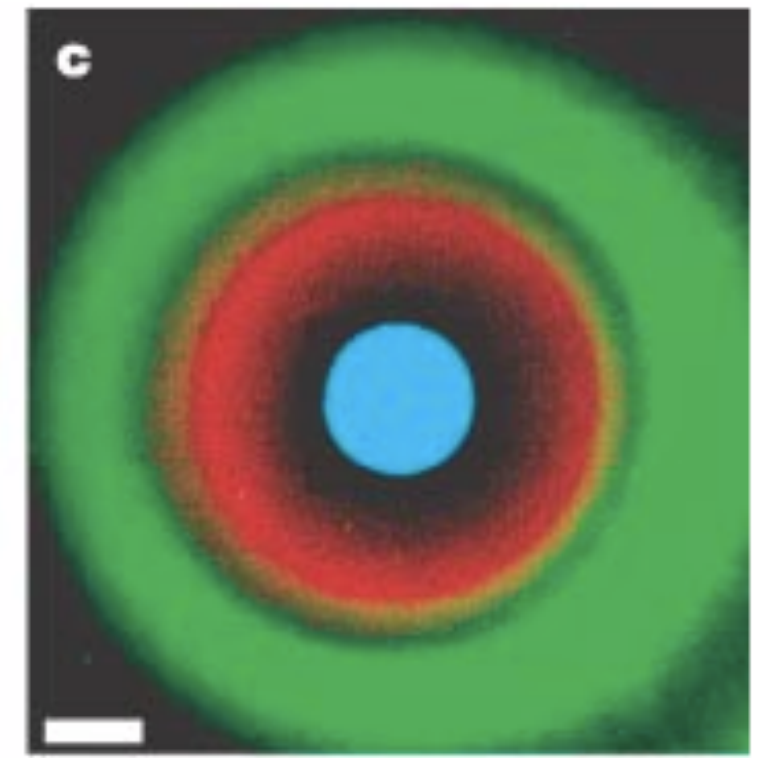
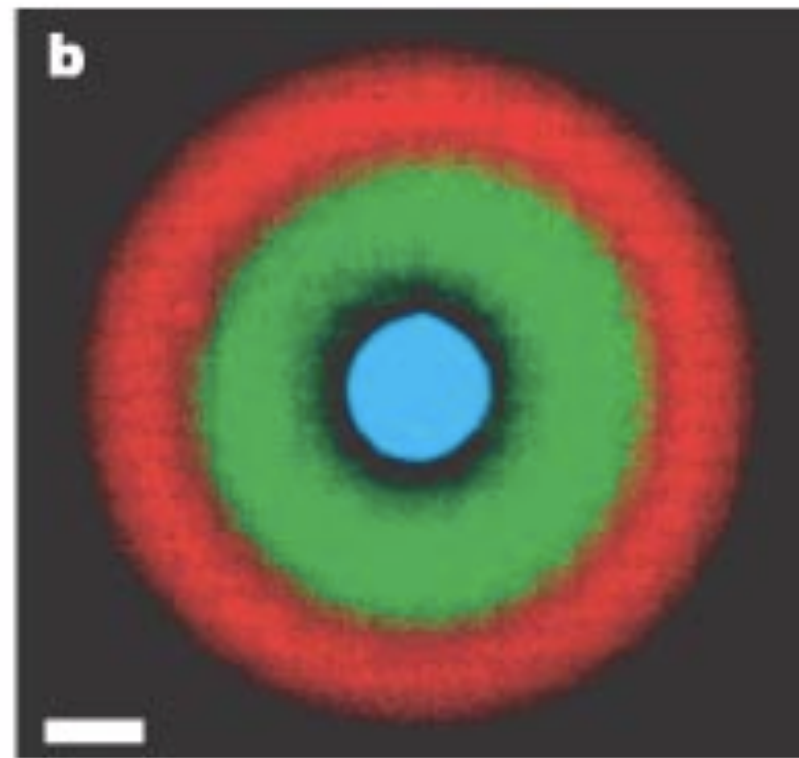
A synchronized quorum of genetic clocks

Tal Danino^{1,4}, Octavio Mondragón-Palomino^{1,4}, Lev Tsimring² & Jeff Hasty^{1,2,3}

The diagram illustrates a quorum sensing circuit within a cell. The circuit consists of a promoter (blue box) that drives the expression of three genes: *luxI* (purple box), *yemGFP* (green box), and *aiiA* (red box). The *luxI* gene produces AHL (autoinducer) molecules (orange dots). The AHL molecules bind to the LuxR protein (blue oval), forming a complex (LuxR-AHL) that acts as a transcription factor. This complex binds to a specific promoter (blue box) to activate the expression of the *yemGFP* and *aiiA* genes. The *aiiA* gene produces AHL molecules, which then bind to the LuxR protein, forming the LuxR-AHL complex. The LuxR-AHL complex binds to the promoter to activate the expression of the *yemGFP* gene. The *yemGFP* gene produces GFP (green dots), which is used for cell-to-cell coupling. The diagram shows the LuxR-AHL complex binding to the promoter to activate the expression of the *yemGFP* and *aiiA* genes. The *aiiA* gene produces AHL molecules, which then bind to the LuxR protein, forming the LuxR-AHL complex. The LuxR-AHL complex binds to the promoter to activate the expression of the *yemGFP* gene. The *yemGFP* gene produces GFP (green dots), which is used for cell-to-cell coupling.

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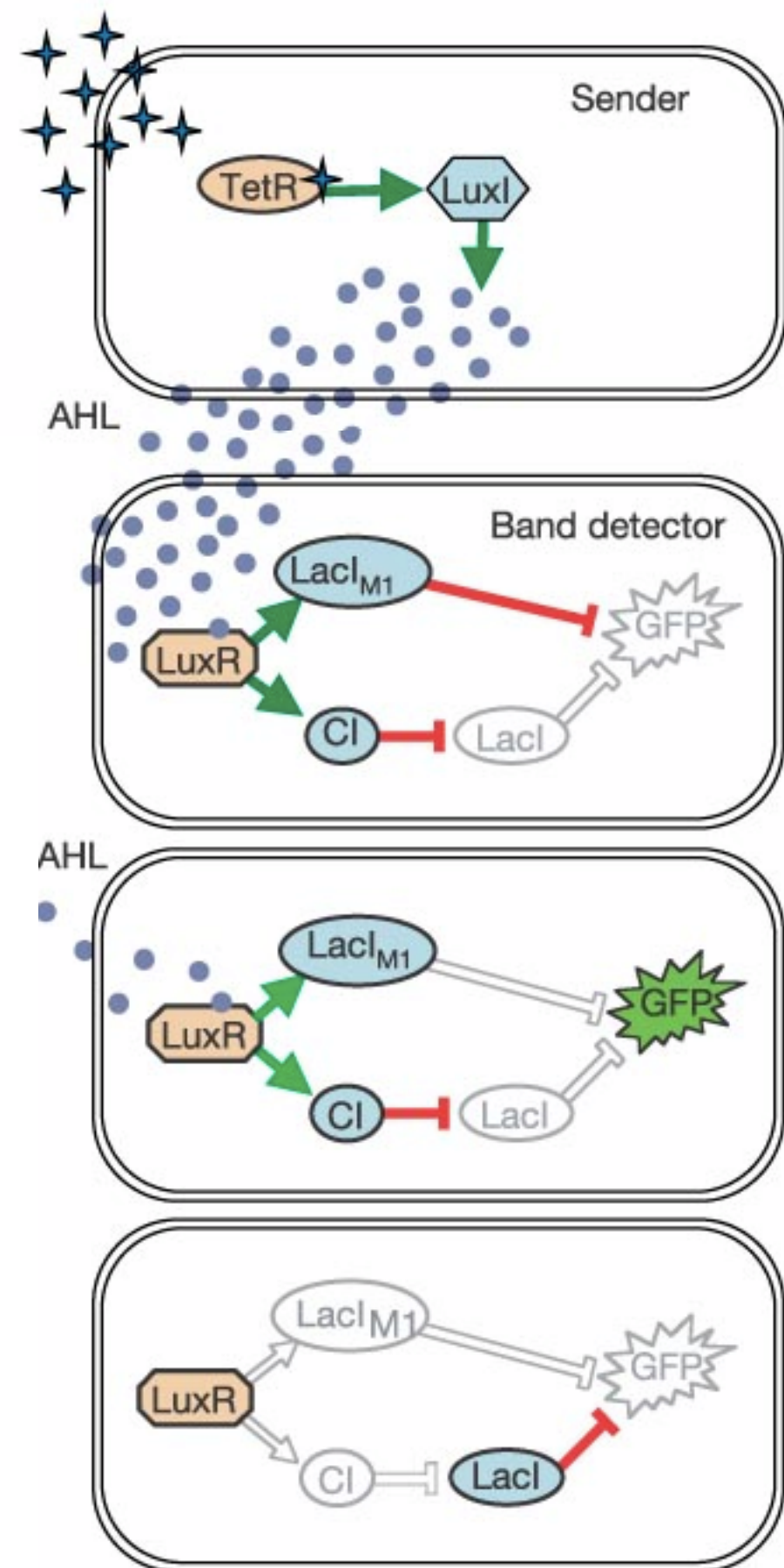


Letters to Nature

Nature **434**, 1130–1134 (28 April 2005) | doi:10.1038/nature03461; Received 3 December 2004;
Accepted 14 February 2005

A synthetic multicellular system for programmed pattern formation

Subhayu Basu¹, Yoram Gerchman¹, Cynthia H. Collins³, Frances H. Arnold³ & Ron Weiss^{1,2}



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